Long-Term Trash Load Reduction Plan and Assessment Strategy

Submitted by:

City of Pacifica

170 Santa Maria Avenue

Pacifica, CA 94044

In compliance with Provisions C.10.c of Order R2-2009-0074

January 27, 2014

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CITY OF PACIFICA
LONG-TERM TRASH LOAD REDUCTION PLAN AND ASSESSMENT STRATEGY

CERTIFICATION STATEMENT

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature by Duly Authorized Representative:

1-27-14

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Associate Civil Engineer

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ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BID	Business Improvement District
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CDS	Continuous Deflection Separator
CEQA	California Environmental Quality Act
CY	Cubic Yards
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GIS	Geographic Information System
MRP	Municipal Regional Stormwater NPDES Permit
MS4	Municipal Separate Storm Sewer System
NGO	Non-Governmental Organization
NPDES	National Pollutant Discharge Elimination System
Q	Flow
SFRWQCB	San Francisco Regional Water Quality Control Board
SWRCB	State Water Resource Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Water Board	San Francisco Regional Water Quality Control Board
WDR	Waste Discharge Requirements

PREFACE

This Long-Term Trash Load Reduction Plan and Assessment Strategy (Long-Term Plan) is submitted in compliance with provision C.10.c of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). The Long-Term Plan was developed using a regionally consistent outline and guidance developed by the Bay Area Stormwater Management Agencies Association (BASMAA) and reviewed by San Francisco Bay Regional Water Quality Control Board staff. The Long-Term Plan is consistent with the Long-Term Trash Load Reduction Framework developed in collaboration with Water Board staff. Its content is based on the City of Pacifica's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with Municipal Separate Storm Sewer (MS4) discharges. This Long-Term Plan is intended to be iterative and may be modified in the future based on information gained through the implementation of trash control measures. The City of Pacifica therefore reserves the right to revise or amend this Long-Term Plan at its discretion. If significant revisions or amendments are made by the City, a revised Long-Term Plan will be submitted to the Water Board through the City's annual reporting process.

1.0 INTRODUCTION

1.1 Purpose of Long-Term Trash Reduction Plan

The Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit for Phase I communities in the San Francisco Bay (Order R2-2009-0074), also known as the Municipal Regional Permit (MRP), became effective on December 1, 2009. The MRP applies to 76 large, medium and small municipalities (cities, towns and counties) and flood control agencies in the San Francisco Bay Region, collectively referred to as Permittees. Provision C.10.c of the MRP requires Permittees to submit a *Long-Term Trash Load Reduction Plan* (Long-Term Plan) by February 1, 2014. Long-Term Plans must describe control measures that are currently being implemented, including the level of implementation, and additional control measures that will be implemented and/or increased level of implementation designed to attain a 70% trash load reduction by July 1, 2017, and 100% (i.e., "No Visual Impact") by July 1, 2022.

This Long-Term Plan is submitted by the City of Pacifica in compliance with MRP provision C.10.c. Consistent with provision C.10 requirements, the goal of the Long-Term Plan is to solve trash problems in receiving waters by reducing the impacts associated with trash in discharges from the City of Pacifica's municipal separate storm sewer system (MS4) that are regulated by NPDES Permit requirements. The Long-Term Plan includes:

1. Descriptions of the current level of implementation of trash control measures, and the type and extent to which new or enhanced control measures will be implemented to achieve a target of 100% (i.e. full) trash reduction from MS4s by July 1, 2022, with an interim milestone of 70% reduction by July 1, 2017;
2. A description of the *Trash Assessment Strategy* that will be used assess progress towards trash reduction targets achieved as a result of control measure implementation; and,
3. Time schedules for implementing control measures and the assessment strategy.

The Long-Term Plan was developed using a regionally consistent outline and guidance developed by the Bay Area Stormwater Management Agencies Association (BASMAA) and reviewed by the San Francisco Bay Regional Water Quality Control Board (Water Board) staff. The Long-Term Plan is consistent with the Long-Term Trash Load Reduction Framework (see section 1.2.1) developed in collaboration with Water Board staff. Its content is based on the City of Pacifica's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with Municipal Separate Storm Sewer (MS4) discharges. The Long-Term Plan builds upon trash control measures implemented by the City prior to the adoption of the MRP and during the implementation of the Short-Term Trash Load Reduction Plan submitted to the Water Board on February 1, 2012.

The Long-Term Plan was reviewed and approved for submittal by the City of Pacifica's City Council on January 27, 2014. The City of Pacifica's Staff Report is attached as Appendix A.

1.2 Background

1.2.1 Long-Term Trash Load Reduction Plan Framework

A workgroup of MRP Permittee, Bay Area countywide stormwater program staff and Water Board staff met between October 2012 and March 2013 to better define the process for developing and implementing Long-Term Plans, methods for assessing progress toward reduction goals, and tracking and reporting requirements associated with provision C.10. Through these discussions, an eight-step framework for developing and implementing Long-Term Plans was created by the workgroup (
Figure 1).

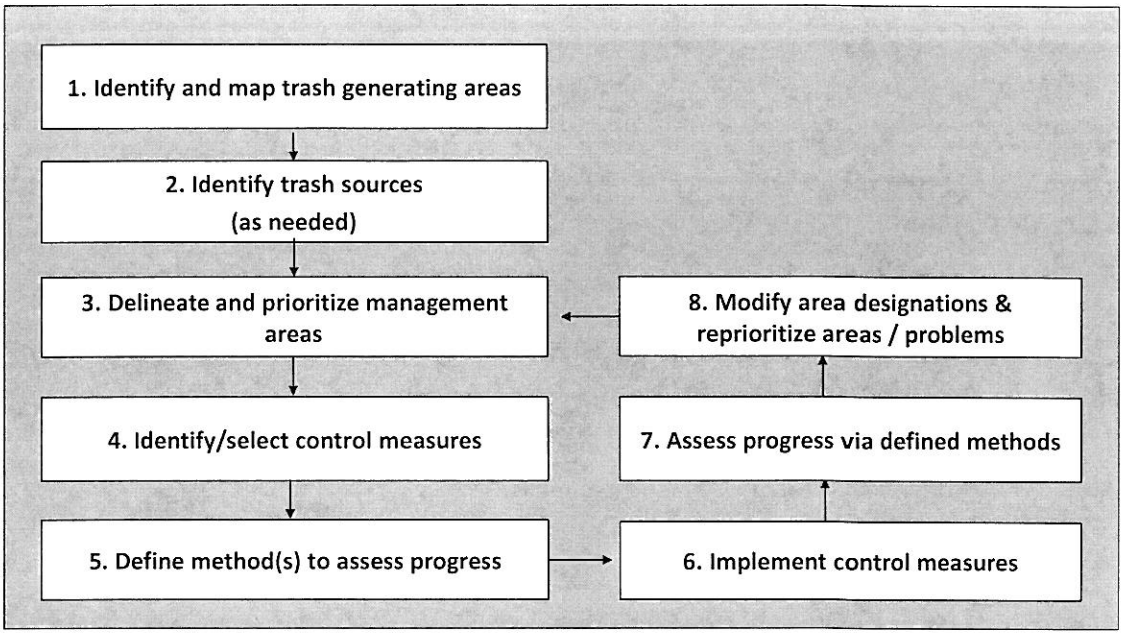

Figure 1. Eight-step framework for developing, implementing and refining Long-Term Trash Reduction Plans.

The workgroup agreed that as the first step in the framework, Permittees would identify very high, high, moderate, and low trash generating areas in their jurisdictional areas. Trash generation rates developed through the *BASMAA Baseline Trash Generation Rates Project* (as discussed below) were used as a starting point for differentiating and delineating land areas with varying levels of trash generation. Permittees would then use local knowledge and field and/or desktop assessments to confirm or refine the level of trash generation for specific areas within their jurisdiction. Each Permittee would then develop a map depicting trash generation categories within their jurisdiction.

As a next step, Permittees would then delineate and prioritize Trash Management Areas (TMAs) where specific control measures exist or are planned for implementation. TMAs delineated by Permittees are intended to serve as reporting units in the future. Reporting at the management

area level provides the level of detail necessary to demonstrate implementation and progress towards trash reduction targets.

Once control measures are selected and implemented, Permittees will evaluate progress toward trash reduction targets using outcome-based assessment methods. As the results of the progress assessments are available, Permittees may choose to reprioritize trash management areas and associated control measures designed to improve trash reduction within their jurisdictions.

1.2.2 BASMAA Generation Rates Project

Through approval of a BASMAA regional project in 2010, Permittees agreed to work collaboratively to develop a regionally consistent method to establish trash generation rates within their jurisdictions. The project, also known as the *BASMAA Trash Generation Rates Project* (Generation Rates Project) assisted Permittees in establishing the rates of trash generation and identifying very high, high, moderate and low trash generating areas.

The term "trash generation" refers to the rate at which trash is produced or generated onto the surface of the watershed and is potentially available for transport via MS4s to receiving waters. Generation rates do not explicitly take into account existing control measures that intercept trash prior to transport. Generation rates are expressed as trash volume/acre/year and were established via the Generation Rates Project.

In contrast to trash generation, the term "trash loading" refers to the rate at which trash from MS4s enters receiving waters. Trash loading rates are also expressed as trash volume/acre/year and are equal to or less than trash generation rates because they account for the effects of control measures that intercept trash generated in an area before it is discharged to a receiving water. Trash loading rates are specific to particular areas because they are dependent upon the effectiveness of control measures implemented within an area. Figure 2 illustrates the difference between trash generation and loading.

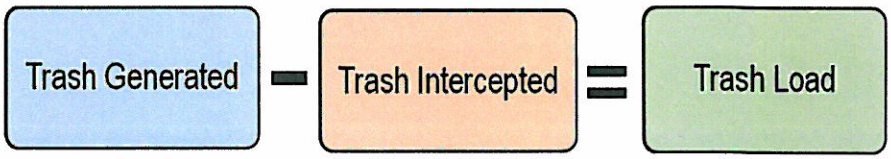

Figure 2. Conceptual model of trash generation, interception and load.

Trash generation rates were estimated based on factors that significantly affect trash generation (i.e., land use and income). The method used to the establish trash generation rates for each Permittee builds off "lessons learned" from previous trash loading studies conducted in urban areas (Allison and Chiew 1995; Allison et al. 1998; Armitage et al. 1998; Armitage and Rooseboom 2000; Lippner et al. 2001; Armitage 2003; Kim et al. 2004; County of Los Angeles 2002, 2004a, 2004b; Armitage 2007). The method is based on a conceptual model developed as an outgrowth of these studies (BASMAA 2011b).

Trash generation rates were developed through the quantification and characterization of trash captured in Water Board-recognized full-capture treatment devices installed in the San

Francisco Bay area. Trash generation rates estimated from this study are listed for each land use type in

Table 1. Methods used to develop trash generation rates are more fully described in BASMAA (2011b, 2011c, and 2012).

Table 1. San Francisco Bay Area trash generation rates by land use (gallons/acre/year).

Land Use	Low[b]	Best[b]	High[b]
Commercial & Services	0.7	**6.2**	17.3
Industrial	2.8	**8.4**	17.8
Residential[a]	0.3 - 30.2	**0.5 - 87.1**	1.0 - 257.0
Retail[a]	0.7 - 109.7	**1.8 - 150.0**	4.6 - 389.1
K-12 Schools	3	**6.2**	11.5
Urban Parks	0.5	**5.0**	11.4

[a] For residential and retail land uses, trash generation rates are provided as a range that takes into account the correlation between rates and household median income.

[b] For residential and retail land uses: Low = 5% confidence interval; Best = best fit regression line between generation rates and household median income; and, High = 95% confidence interval. For all other land use categories: High = 90th percentile; Best = mean generation rate; and, Low = 10th percentile.

1.2.3 Short-Term Trash Load Reduction Plan

In February 2012, the City of Pacifica developed a Short-Term Plan that described the current level of control measures implementation and identified the type and extent to which new or enhanced control measures would be implemented to attain a 40% trash load reduction from its MS4 by July 1, 2014. Since that time, the City of Pacifica has begun to implement its short-term plan. Control measures implemented to date via the short-term trash reduction plan are:

Single-use Carryout Plastic Bag Policy

San Mateo County adopted an ordinance prohibiting the distribution of single-use carryout plastic bags. The ordinance prohibits ALL retail establishments (with the exception of restaurants) from distributing single-use carryout plastic bags.

The ordinance became effective April 22, 2013.

Polystyrene Foam Food Service Ware Policy

The City of Pacifica adopted an ordinance banning polystyrene foam food service ware at the point-of-sale. Food vendors are prohibited from providing prepared food to customers in foam polystyrene or solid polystyrene disposable food service ware. No foam polystyrene or solid polystyrene disposable food service ware shall be used in any City facilities. No city department or agency will purchase or acquire foam polystyrene or solid polystyrene disposable food service ware for use at City facilities. All individuals, entities or organizations using City facilities for public or private events shall comply with the requirements in this article.

The ordinance became effective on January 1, 2010.

Public Education and Outreach Programs

Through participation and funding of the regional BASMAA Youth Outreach Campaign the City of Pacifica contributed to outreach campaign designed to reduce littering from the target audience in the Bay Area. Through participation and funding of the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), the City of Pacifica continues to implement litter reduction outreach to school-age children and youth. The City of Pacifica will continue run at least two press releases or PSAs on local public television which focuses on litter issues each year (e.g., creek clean-up activities, preventing litter by using reusable containers, etc.).

Reduction of Trash from Uncovered Loads

The City of Pacifica implemented the following: Enhanced control measures to reduce trash from vehicles with uncovered loads. The City include will language in a hauling service contract(s) that requires contracted trash and construction debris haulers to cover loads when transporting trash and debris to municipally or privately-owned landfills and transfer stations.

Anti-Littering and Illegal Dumping Enforcement Activities

The City of Pacifica anti-littering and illegal dumping enforcement program include:

- Thorough investigations of complaints received from an illegal dumping hotline;
- The implementation of enforcement procedures including citations (as warranted); and,
- The collection of evidence (e.g., names, addresses, etc.) from illegal dump sites (i.e., public and private) in an attempt to identify offenders.

Enhanced On-Land Trash Cleanups (Volunteers and/or Municipal)

City of Pacifica is conducting or coordinating the following new or enhanced on-land trash cleanup activities listed below. These on-land cleanups will be conducted or coordinated each year and the volume of trash removed will be tracked to demonstrate trash loads reduced.

- New or enhanced City-led on-land cleanups include the Sheriff Work Program
- New or enhanced Volunteer-led on-land cleanups include the Adopt-a-Landscape Program

Full-Capture Treatment Devices

A total of **62** trash full-capture treatment devices have been be installed in the City of Pacifica.

Creek/Channel/Shoreline Cleanups

City of Pacifica conducts the following MRP-required and non MRP-required creek/channel/shoreline cleanups listed below. Both types of cleanups will be conducted each year and the volume of trash removed will be tracked to demonstrate trash loads reduced.

- **MRP-required cleanup** is located along the Pacifica State Beach;
- **Non MRP-required shoreline cleanups** are located on Sharp Park Beach, Rockaway Beach and Pacifica State Beach; and

- **Non MRP-required creek cleanup** is located on San Pedro Creek.

Control measures described in this Long-Term Plan build upon actions taken to-date via City of Pacifica's Short-Term Plan. A full description of control measures implemented via short and long-term plans is included in section 3.2. Outcomes associated with short-term plan implementation will be reported in the City of Pacifica's Fiscal Year 2013-14 Annual Report, scheduled for submittal to the Water Board by September 15, 2014.

1.3 Organization of Long-Term Plan

This Long-Term Plan is organized into the following sections:

1.0 Introduction;
2.0 Scope of the Trash Problem;
3.0 Trash Management Areas and Control Measures;
4.0 Progress Assessment Strategies; and
5.0 References

Section 2.0 is intended to provide a description of the extent and magnitude of the trash problem in the City of Pacifica. Control measures that will be implemented by City of Pacifica as a result of this Long-Term Plan are described in section 3.0. Section 4.0 describes the methods that will be used to assess progress toward trash reduction targets.

2.0 SCOPE OF THE TRASH PROBLEM

2.1 Permittee Characteristics

Incorporated in 1957, the City of Pacifica covers 8,072 acres in Santa Mateo County, and has a jurisdictional area of 3,296 acres. According to the 2010 Census, it has a population of 37,234, with a population density of 2,941.1 people per square mile and average household size of 3.21. Of the 37,234 residents who call City of Pacifica home, 20.7% are under the age of 18, 7.6% are between 18 and 24, 26.9% are between 25 and 44, 32.6% are between 45 and 64, and 12.1% are 65 or older. The median household income was $87,000 in 2010. Pacifica is located just 12 miles south of San Francisco along the scenic coast of the Pacific Ocean. Known for its natural beauty, Pacifica is filled with numerous hiking trails through rolling hills that overlook the ocean surf and forested canyons. The City of Pacifica is home to numerous hotels with conference rooms, variety of restaurants and shops just a stroll away from hotels and beaches.

The City of Pacifica is a popular surfing, biking and hiking destination and is divided into twelve neighborhoods - Fairmont, Westview (Pacific Highlands), Pacific Manor (Manor), Edgemar, Sharp Park, Fairway Park, Vallemar and Rockaway Beach, Pedro Point and Shelter Cove, Linda Mar, Linda Mar Valley and Park Pacifica. Pacifica is a coastal community that State Route 1 runs through, carrying considerable vehicular traffic. The homeless issue is negligible and few areas would be considered disadvantaged.

Land uses within City of Pacifica depicted in ABAG (2005) are provided in Table **2**. The City of Pacifica is primary comprised of 6 land uses. These include Commercial and Services, Industrial, Residential, Retail, K-12 Schools and Urban Parks.

Table 2. Percentages of the City of Pacifica's jurisdictional area1 within land use classes identified by ABAG (2005)

Land Use Category	Jurisdictional Area (acres)	% of Jurisdictional Area
Commercial and Services	109.2	1.4%
Industrial	41.5	0.5%
Residential	2,372.9	30.0%
Retail	112.0	1.4%
K-12 Schools	238.5	3.0%
Urban Parks	91.5	1.2%
Other (Open Space)	4,932.2	62.5%

2.2 Trash Sources and Pathways

Trash in San Francisco Bay Area creeks and shorelines originates from a variety of sources and is transported to receiving waters by a number of pathways (Figure 3). Of the four source

[1] A Permittee's jurisdictional area is defined as the urban land area within a Permittee's boundary that is not subject to stormwater NPDES Permit requirements for traditional and non-traditional small MS4s (i.e. Phase II MS4s) or the California Department of Transportation, or owned and maintained by the State of California, the U.S. federal government or other municipal agency or special district (e.g., flood control district).

categories, pedestrian litter includes trash sources from high traffic areas near businesses and schools, transitional areas where food/drinks are not permitted (e.g. bus stops), and from public or private special events with high volumes of people. Trash from vehicles occurs due to littering from automobiles and uncovered loads. Inadequate waste container management includes sources such as overflowing or uncovered containers and dumpsters as well as the dispersion of household and business-related trash and recycling materials before, during, and after collection. On-land illegal dumping of trash is the final source category.

Trash is transported to receiving waters through three main pathways: 1) Stormwater Conveyances; 2) Wind; and, 3) Direct Dumping. Stormwater or urban runoff conveyance systems (e.g., MS4s) consist of curbs/gutters, and pipes and channels that discharge to urban creeks and the San Francisco Bay shorelines. Wind can also blow trash directly into creeks or the Bay. Lastly, trash in receiving waters can also originate from direct dumping into urban creeks and shorelines.

This Long-term Plan and associated trash control measures described in Section 3.0 are focused on reducing trash from one of the transport pathways illustrated in Figure 3. Trash sources categories and transport pathways to urban creeks.
Specifically, the Long-term Plan is focused on reducing the impacts of discharges from MS4s to San Francisco Area receiving waters and the protection of associated beneficial uses.

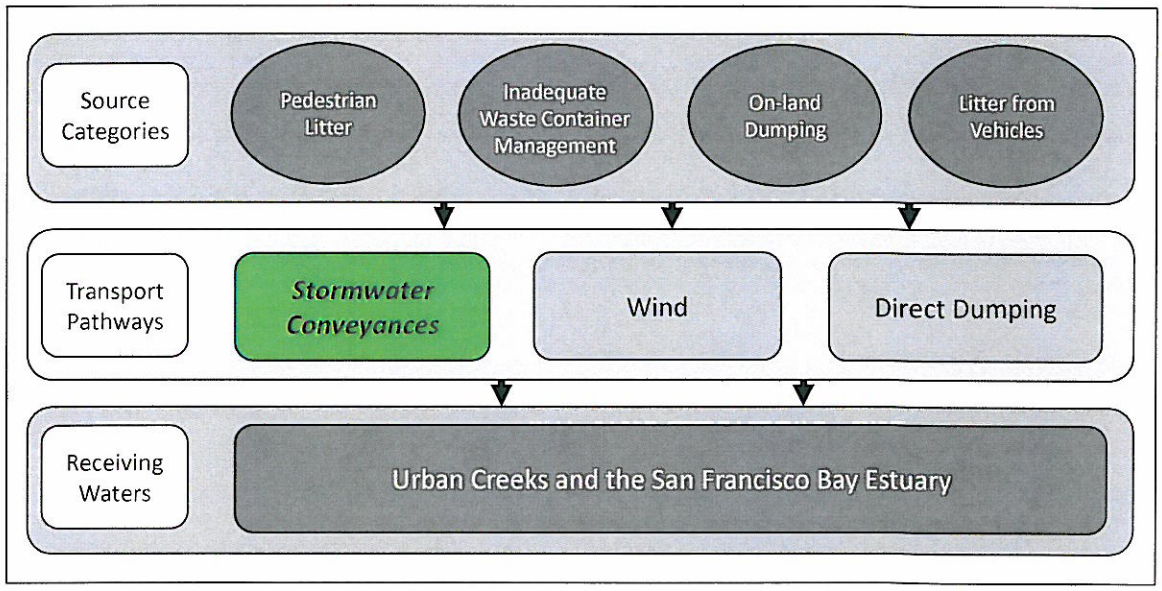

Figure 3. Trash sources categories and transport pathways to urban creeks.

The City of Pacifica currently implements on land assessment & maintenance of public areas along San Pedro Creek. City of Pacifica Public Works staff annually cleans the entire length of San Pedro Creek. Local support from volunteer groups also do regular creek clean ups as well as public parks and beaches. Homeless encampments are regularly removed when reported or discovered by staff.

Full trash capture devices have been installed in neighborhoods where San Pedro Creek runs through. Parks Maintenance workers regularly empty trash containers in parks that are close to creek areas.

2.3 Trash Generating Areas

2.3.1 Generation Categories and Designation of Areas

The process and methods used to identify the level of trash generation within the City of Pacifica are described in this section and illustrated in Figure 4.

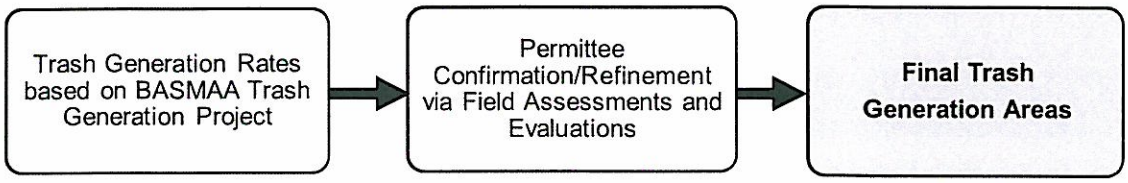

Figure 4. Trash sources categories and transport pathways to urban creeks.

As a first step, trash generation rates developed through *the BASMAA Trash Generation Rates Project* were applied to parcels within the City of Pacifica based on current land uses and 2010 household median incomes. A Draft Trash Generation Map was created as a result of this application. The draft map served as a starting point for the City of Pacifica to identify trash generating levels. Levels of trash generation are depicted on the map using four trash generation rate (gallons/acre/year) categories that are symbolized by four different colors illustrated in Table 3.

Table 3. Trash generation categories and associated generation rates (gallons/acre/year).

Category	Very High	High	Moderate	Low
Generation Rate (gallons/acre/year)	> 50	10-50	5-10	< 5

The City of Pacifica then reviewed and refined the draft trash generation map to ensure that trash generation categories were correctly assigned to parcels or groups of parcels. City staff refined maps using the following process:

1. Based upon our knowledge of trash generation and problem areas within the City, staff identified areas on the draft map that potentially had incorrect trash generation category designations.
2. Trash generation category designations initially assigned to areas identified in step #1 were then assessed and confirmed/refined by the City using the methods listed below.

a. On-Land Visual Assessments

To assist Permittees with developing their trash generation maps, BASMAA developed a *Draft On-land Visual Trash Assessment Protocol (Draft Protocol)*. The Draft Protocol entails walking a street segment and visually observing the level of trash present on the

roadway, curb and gutter, sidewalk, and other areas adjacent to the street that could potentially contribute trash to the MS4. Based on the level of trash observed, each segment (i.e., assessment area) was placed into one of four on-land assessment condition categories that are summarized in Table 4. Using the Draft Protocol the city assessed a total of seven areas to assist in conducting/refining trash generating area designations.

After defining the City of Pacifica trash generation map, staff first looked at all the areas on Google maps & took notes on same areas. Next step was to identify when trash day was for each area & then do a site visit the day before the trash pickup. We walked each site and surrounding streets to verify trash load and took pictures for each area. This took staff 4 days to complete. During the individual visits, we contacted business owners to inquire about specific trash complaints/issues.

Table 4. Definitions of on-land trash assessment condition categories.

On-land Assessment Condition Category	Summary Definition
A (Low)	Effectively no trash is observed in the assessment area.
B (Moderate)	Predominantly free of trash except for a few pieces that are easily observed.
C (High)	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets.
D (Very High)	Trash is continuously seen throughout the assessment area, with large piles and a strong impression of lack of concern for litter in the area.

b. Querying Municipal Staff or Members of the Public

City maintenance staff was asked to provide input on the trash problem throughout the City and compared their data with the draft trash generation map.

c. Reviewing Municipal Operations Data

City maintenance records were also reviewed and the data compared to the draft trash generation map.

d. Viewing Areas via Google Maps – Street View

City staff first looked at all the areas on Google maps & took notes and compared to the draft trash generation map

3. Based on assessments conducted to confirm/refine trash generation category designations, the City created a final trash generation map that depicts the most current understanding of trash generation within the City of Pacifica. The City documented this process by tracking the information collected through the assessments and subsequent

refinements to the Draft Trash Generation Map. The City of Pacifica's Final Trash Generation Map is included as Figure 5.

2.3.2 Summary of Trash Generating Areas and Sources

Summary statistics for land use and trash generation categories generated through the mapping and assessment process are presented in Table 5.

Table 5. Percentage of jurisdictional area within the City of Pacifica assigned to each trash generation category.

Trash Generation Category	Jurisdictional Area (Acres)	Commercial and Services	Industrial	Residential	Retail	K-12 Schools	Urban Parks	Other
Very High	0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High	99.4	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Medium / High	4.9	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Medium	472.4	21.6%	5.0%	5.0%	0.2%	50.4%	17.8%	0.0%
Low	7,320.8	0.1%	0.2%	32.1%	0.1%	0.0%	0.1%	67.4%

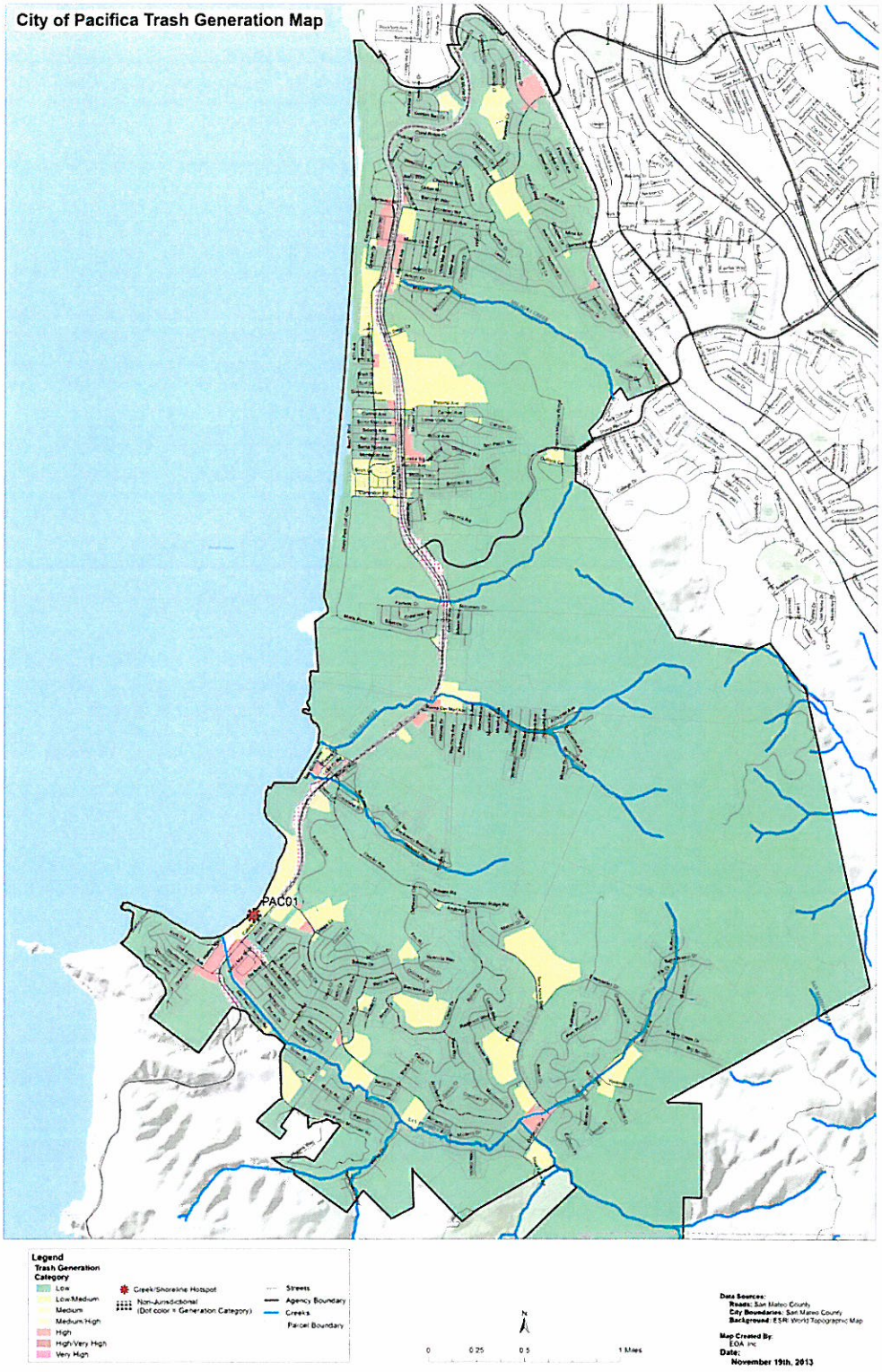

Figure 5. Final Trash Generation Map for the City of Pacifica

3.0 TRASH MANAGEMENT AREAS AND CONTROL MEASURES

This section describes the control measures that the City of Pacifica has or plans to implement to solve trash problems and achieve a target of 100% (i.e. full) trash reduction from their MS4 by July 1, 2022. The selection of control measures described in this section is based on the City of Pacifica's current understanding of trash problems within its jurisdiction and the effectiveness of control measures designed to reduce trash impacts associated with MS4 discharges. Information on the effectiveness of some trash control measures is currently lacking and therefore in the absence of this information, the City based its selection of control measures on existing effectiveness information, their experience in implementing trash controls and knowledge of trash problems, and costs of implementation. As knowledge is gained through the implementation of these control measures, the City may choose to refine their trash control strategy described in this section. If significant revisions or amendments are made, a revised Long-Term Plan will be submitted to the Water Board through the City of Pacifica's annual reporting process.

3.1 Management Area Delineation and Prioritization

Consistent with the long-term plan framework, the City of Pacifica delineated and prioritized trash management areas (TMAs) based on the geographical distribution of trash generating areas, types of trash sources, and current or planned control measure locations. TMAs are intended to form the management units by which trash control measure implementation can be tracked and assessed for progress towards trash reduction targets. Once delineated, TMAs were also prioritized for control measure implementation. The City of Pacifica's primary management areas were selected based on the spatial distribution of trash generating areas and the location of specific existing or planned management actions within City's jurisdiction. City staff used the following procedure to designate TMAs:

Our process included on land site visits, local knowledge of specific sites based on prior complaints & observation by staff. Size of a particular complex & location with other trash generating sources (ie, fast food businesses, apartment complex, etc.) were also analyzed.

A map depicting the City's TMAs is included as Figure 6. All jurisdictional areas within the city are included within a TMA. The amount of jurisdictional land area and associated trash condition categories for each TMA are included in Table 6.

Table 6. Jurisdictional area and percentage of each Trash Management Area (TMA) comprised of trash generation categories

TMA	Jurisdictional Area (Acres)	Trash Generation Rate			
		Very High	High	Medium	Low
1A	12.1	0.0%	92.9%	6.5%	0.6%
1B	28.6	0.0%	100.0%	0.0%	0.0%
1C	11.3	0.0%	100.0%	0.0%	0.0%
1D	9.4	0.0%	79.8%	14.1%	6.1%
1E	13.6	0.0%	71.1%	22.7%	6.3%
1F	1.1	0.0%	100.0%	0.0%	0.0%
2A	45.9	0.0%	0.0%	100.0%	0.0%
2B	11.9	0.0%	0.0%	100.0%	0.0%
2C	8.1	0.0%	0.0%	100.0%	0.0%
2D	15.2	0.0%	0.0%	100.0%	0.0%
2E	13.4	0.0%	0.0%	100.0%	0.0%
2F	22.9	0.0%	0.0%	100.0%	0.0%
2G	69.6	0.0%	0.0%	100.0%	0.0%
2H	16.3	0.0%	0.0%	100.0%	0.0%
2I	19.8	0.0%	0.0%	100.0%	0.0%
3A	78.7	0.0%	6.5%	45.2%	48.3%
3B	9.7	0.0%	48.9%	21.9%	29.3%
3C	12.4	0.0%	33.7%	43.6%	22.7%
3D	17.0	0.0%	14.9%	74.0%	11.1%
3E	2.5	0.0%	40.1%	59.9%	0.0%
3F	11.1	0.0%	80.2%	17.0%	2.8%
3G	26.1	0.0%	5.8%	94.2%	0.0%
3H	9.9	0.0%	7.2%	0.5%	43.0%
4A	6.3	0.0%	0.0%	100.0%	0.0%
4B	17.5	0.0%	0.0%	100.0%	0.0%
4C	1.4	0.0%	0.0%	100.0%	0.0%
4D	18.8	0.0%	0.0%	100.0%	0.0%
4E	21.4	0.0%	0.0%	100.0%	0.0%
4F	9.3	0.0%	0.0%	100.0%	0.0%
5A	33.0	0.0%	0.0%	99.7%	0.3%
5B	1.9	0.0%	0.0%	99.3%	0.7%
6B	27.0	0.0%	0.0%	97.8%	2.2%
6C	11.8	0.0%	0.0%	100.0%	0.0%
7	7,282.6	0.0%	0.0%	0.2%	99.8%

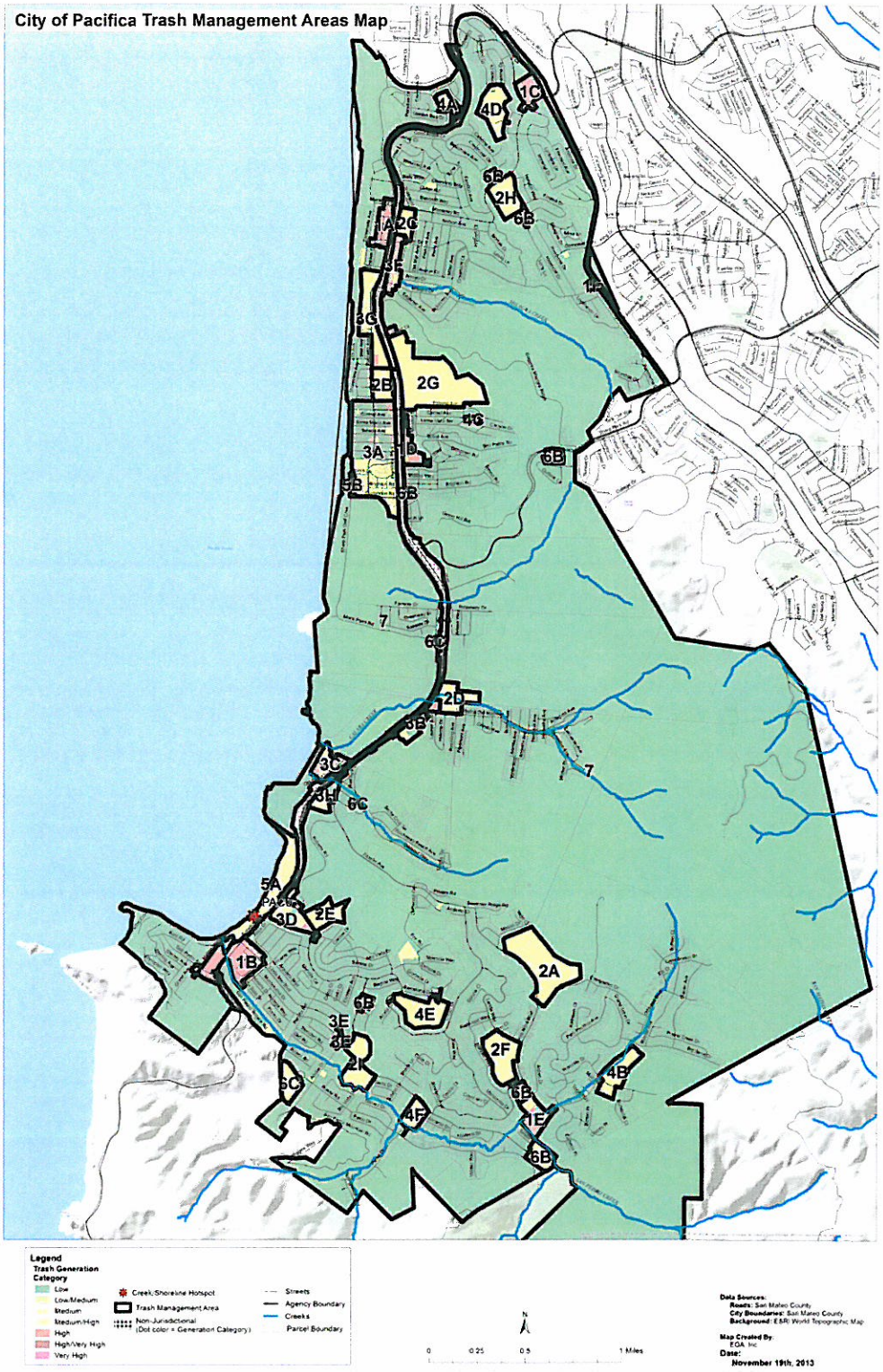

Figure 6. Trash Management Area Map for the City of Pacifica.

3.2 Current and Planned Trash Control Measures

The City of Pacifica has begun to implement its short-term plan. Control measures implemented to date via the short-term trash reduction plan are listed on section 1.2.3. Other Control Measures that are continued to be implemented are:

Street Sweeping

The City of Pacifica's baseline street sweeping program includes sweeping most streets in residential areas twice per month, most streets in the downtown area once every two weeks, and sweeping most arterials roads twice per month. The City's current street sweeping program includes sweeping most streets in residential areas and the downtown area once every two weeks, and sweeping arterial roads once a week. Existing enhanced street sweeping includes street sweeping conducted at a frequency greater than **1x/week** for streets within retail land use areas or greater than **2x/month** for streets in all other land use areas.

Parking enforcement signs for street sweeping are not posted in the City, but parking enforcement equivalent occurs on major arterials and some roads in close proximity to commercial, recreational, or high density residential areas.

Storm Drain Inlet Maintenance

Storm drain inlets throughout the City are cleaned at a minimum once per year.

Stormwater Pump Station Maintenance

The City of Pacifica owns and maintains two stormwater pump stations. Both have trash racks that capture trash and allow for removal during maintenance.

3.2.1 Trash Management Area #1

Food Retail Areas

Pacific Manor Shopping Center Area – TMA 1A

This shopping district includes grocery stores, a fitness center, post office, several eating/drinking establishments, automatic bank tellers, specialty & gift shops, video rental stores, hardware store and gasoline stations.

Linda Mar Shopping Center – TMA 1B

Pacifica's largest shopping center is home to a major grocery store, a drug store, clothing stores, eating/drinking establishments, banks, video rental stores, gift & specialty stores and professional offices.

Fairmont Shopping Center – TMA 1C

This shopping center is located just off the intersection of Highway 1 and Highway 35 on Hickey Boulevard. The Fairmont Shopping Center is located on the Pacifica/Daly City border. Stores include a major grocery store, large drug store, several eating establishments, auto repair/tire shop, cable television provider and specialty shops.

Eureka Square – TMA 1D

Located in the heart of Pacifica off Highway 1 in the Sharp Park District, this shopping center houses two banks, a grocery store, eating/drinking establishments, specialty shops and several professional offices.

Park Mall Shopping Center – TMA 1E

Pacifica's neighborhood shopping center, this indoor/outdoor mall is surrounded by the beauty of the hills of Pacifica. Shops include a grocery store, restaurants, gasoline station, fitness center, specialty shops and professional offices. Park Mall is a major convenience for many residences that live back in the valley.

Ramallah Plaza – TMA 1F

Located along Skyline Boulevard (Highway 35) and Manor Drive, this handy little strip offers a quick-stop market, sushi restaurant, preschool, dry cleaner and a self-service laundry.

Trash generated in these areas mainly come from the large food retail establishments and other business in the area. Litter, waste, and garbage from dumpster areas and parking lots are left on the ground to wash away with rainwater to the gutter, storm drains, ocean or creeks.

Planned Trash Control Measures

Full Trash Capture Devices

The City of Pacifica has installed 62 inlet screen trash capture devices throughout the city, some of which are located within the food retail areas. The City plans to install full trash capture devices between FY 2013 to 2015 to cover the entire food retail trash management areas.

The City of Pacifica's Trash Full Capture Device is included as Figure 5.

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 1x/week for streets within retail land use areas will be increased to 2x/week for streets within the food retail areas (TMA 1A through TMA 1E) starting FY 2017. The majority of streets fronting these areas have no parking zones; therefore street sweeping will be effective in reaching the curb and removing trash.

On-land Trash Cleanups

Actions initiated prior to and continued after the MRP effective date and implemented prior to July 1, 2014 include trash clean up conducted by Public Works staff twice a month.

Actions planned for future implementation between July 2014 and July 2022 include City led clean up on specific high trash generating areas stepped up to weekly or 4 times a month. These area include TMA 1A, TMA 1B, TMA 1D and TMA 1E.

3.2.2 Trash Management Area #2

Schools

The public elementary and middle school district, known as Pacifica School District, consists of Vallemar (TMA 2D), Cabrillo, Ingrid B. Lacy (TMA 2B), Sunset Ridge, Ortega (TMA 2H), Linda Mar and Ocean Shore schools (TMA 2C). Each school enrolls about 550-600 students. There are two private K-8 schools, Good Shepherd School and Alma Heights Christian Academy.

Pacifica has one private high school and two public high schools which are part of the Jefferson Union High School District. Oceana High School (TMA 2G) is located in the central part of the city while Terra Nova High School (TMA 2A) and Alma Heights Christian High School (TMA 2I) are in the south.

Trash in these areas mainly comes from the drop off locations and from the frequently used play fields in the schools.

Planned Trash Control Measures

On-land Trash Cleanups

Actions planned for future implementation between July 2014 and July 2022 include clean up on specific high trash generating areas (TMA 2A through TMA 2I) stepped up to weekly or 4 times a month. The City will work with the School Districts and implement on land trash clean ups with School district personnel and students starting in FY 2020.

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 2x/month for streets in this Trash Management area will be increased to 1x/week for streets within the School areas (TMA 2A through TMA 2I) starting FY 2017. A number of streets fronting these school areas have no parking zones; therefore street sweeping will be effective in reaching the curb and removing trash.

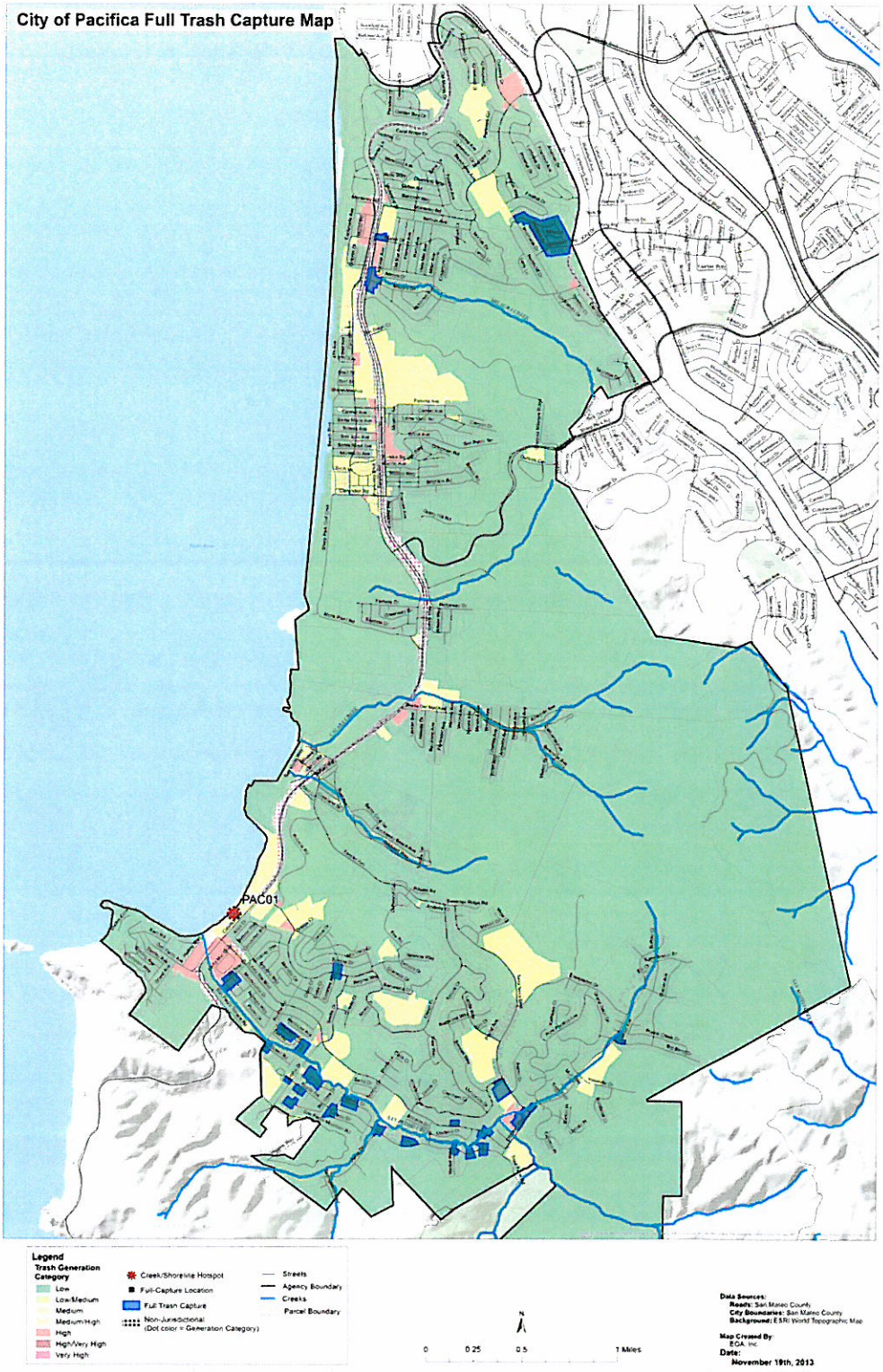

Figure 7. Trash Full Capture Device Map for the City of Pacifica.

3.2.3 Trash Management Area #3

Retail Commercial

Sharp Park District – TMA 3A

This shopping center includes eating/drinking establishments, specialty shops and several professional offices.

Vallemar Center – TMA 3B

This nostalgic shopping area is right on Highway 1 at Reina Del Mar. Neighbored by coastal hills, a school and residential area. This district has eating/drinking establishments, grocery store, professional offices, gasoline station, auto repair shop and specialty stores.

Rockaway Beach Plaza – TMA 3C

Home to several of Pacifica's hotels and neighbored by Highway 1, the beautiful Rockaway Beach and scenic hills. This indoor/outdoor shopping area includes several eating/drinking establishments, specialty stores, gift shops and professional offices.

Palmetto Shopping District – TMA 3G

This shopping area is the home of the annual Pacifica Fog Fest and is located just blocks away from both the Pacific Ocean and Highway 1. This district has several eating/drinking establishments, specialty shops, gift stores, veterinary clinics, trade services, auto repair shops, gasoline station and professional offices. Municipal government offices, hotels, golf course, schools and coastal residential areas are close by.

Trash generated in these areas mainly come from the many small locally owned businesses in the area. Litter, waste, and garbage from dumpster areas and parking lots are left on the ground to wash away with rainwater to the gutter, storm drains, ocean or creeks.

Planned Trash Control Measures

Full Trash Capture Devices

The City of Pacifica has installed 62 inlet screen trash capture devices throughout the city, some of which are located within the retail commercial areas. The City plans to install trash capture devices to cover the entire retail commercial trash management areas starting in FY 2013.

The City of Pacifica's Trash Full Capture Device is included as Figure 5

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 1x/week for streets within retail land use areas will be

increased to 2x/week for streets within the retail Trash Management Areas starting FY 2017.

3.2.4 Trash Management Area #4

Parks and Playfields

The Pacifica has several children playground (TMA 4A – TMA 4E) areas throughout the City and are used daily, especially during the spring and summer months.

The Public Works Park Division maintains four city baseball fields (TMA 4F) and two city soccer fields. The lawns are mowed weekly and the fields are kept clean and in good shape.

Trash in these areas mainly comes from the frequently used playground and play fields in the City Parks.

Planned Trash Control Measures

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 2x/month for streets in this Trash Management area will be increased to 1x/week for streets within the Parks and Playfields areas starting FY 2017.

On-land Trash Cleanups

Actions planned for future implementation between July 2014 and July 2022 include City led clean up on specific high trash generating areas stepped up to weekly or 4 times a month. These area include TMA 4A through TMA 4F.

3.2.5 Trash Management Area #5

Beaches

Pacifica State Beach – TMA 5A

Pacifica State Beach (Linda Mar Beach) offers a recreation trail along the ocean, surfing and surf camps, restrooms and showers and is very popular for dog walking. Pacifica is also home to one of the best fishing piers in the state.

Sharp Park Beach – TMA 5B

Sharp Park Beach has picnic facilities, pier with cafe, fishing, a walking promenade, vista point parking and nature trails. Pacifica is also home to one of the best fishing piers in the state and is open daily.

Trash in these areas mainly comes from the frequently used beaches, beach trails and picnic facilities.

Planned Trash Control Measures

On-land Trash Cleanups

Actions planned for future implementation include Volunteer led clean up on specific high trash generating areas stepped up to weekly or 4 times a month starting in FY 2016. The City has worked and will continue to work with the Pacifica Beach Coalition in various annual beach clean ups. The Pacifica Beach Coalition is a project of Pacifica's Environmental Family, a registered nonprofit organization that supports and provides fiscal sponsorship to local environmental projects in Pacifica. The Pacifica Beach Coalition is dedicated to preserving the ocean, coastal habitat and wildlife, and ending litter, through advocacy, education, community building, and citizen action.

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 2x/month for streets in this Trash Management area will be increased to 1x/week for streets within the beach areas starting FY 2017.

3.2.6 Trash Management Area #6

Churches and Community Organizations

Residents of Pacifica enjoy access to a variety of city services, educational institutions and non profit organizations. Pacifica's strong sense of community is evidenced by the array of places of worship, social groups and local organizations that are active within its boundaries.

Trash in these areas mainly comes from churches and buildings occupied by local community organizations.

Planned Trash Control Measures

Improved Trash Bins/Container Management

The City will work with Recology, the City's waste management provider, to improve management of trash bins and containers. The City will review the existing franchise agreement and insert additional management or enforcement language or revise the agreement on the next renewal.

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 2x/month for streets in this Trash Management area will be increased to 1x/week for the rest of the City starting FY 2017.

3.2.7 Trash Management Area #7

Rest of City

Pacifica is framed by the ridges of the Coast Range on the east and the Pacific Ocean on the west. Over half of the land in this small city is protected open space with numerous city, county and state parks. More than one thousand acres belong to the famed Golden Gate National Recreation Area. Because Pacifica evolved as several separate beach communities, there is no town center but rather a string of small shopping centers and commercial areas. Many of the homes are hidden along peaceful valleys tucked away from the busy Coast Highway.

Trash in these areas mainly comes from the residential neighborhoods.

Planned Trash Control Measures

Improved Trash Bins/Container Management

The City will work with Recology, the City's waste management provider, to improve management of trash bins and containers. The City will review the existing franchise agreement and insert additional management or enforcement language or revise the agreement on the next renewal.

Street Sweeping

The existing enhanced street sweeping implemented prior to July 1, 2014 at a frequency greater than 2x/month for streets in this Trash Management area will be increased to 1x/week for the rest of the City starting FY 2017.

3.2.8 Jurisdiction-wide Control Measures

Trash assessment studies have concluded that plastic comprised a majority of the total items removed. The City of Pacifica along with SMWCPPP has participated in many Jurisdictional-wide programs to control trash such as plastics.

Pacifica is also a coastal community that State Route 1 runs through, carrying considerable vehicular traffic and consequently trash from those vehicles. Much of the trash comes from illegal dumping and improperly secured and uncovered loads.

Planned Trash Control Measures

Single-use Carryout Plastic Bag Policy

San Mateo County adopted an ordinance prohibiting the distribution of single-use carryout plastic bags. The ordinance prohibits ALL retail establishments (with the exception of restaurants) from distributing single-use carryout plastic bags.

The City of Pacifica has promoted the San Mateo County Reusable Bag Ordinance through various outreach efforts during several City events and Earth Day. Pacifica purchased one thousand reusable bags to distribute at these events.

Polystyrene Foam Food Service Ware Policy

The City of Pacifica adopted an ordinance effective January 10, 2010 banning polystyrene foam food service ware at the point-of-sale. Food vendors are prohibited from providing prepared food to customers in foam polystyrene or solid polystyrene disposable food service ware. Potential vendors are provided information during Planning and Building permit review.

Public Education and Outreach Programs

Through participation and funding of the regional BASMAA Youth Outreach Campaign the City of Pacific contributed to outreach campaign designed to reduce littering from the target audience in the Bay Area. Through participation and funding of the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), the City of Pacifica continues to implement litter reduction outreach to school-age children and youth. The City of Pacifica will continue run at least two press releases or PSAs on local public television which focuses on litter issues each year (e.g., creek clean-up activities, preventing litter by using reusable containers, etc.).

3.2.9 Creek and Shoreline Hot Spot Cleanups

The City of Pacifica in compliance with the MRP, selected a shoreline hot spot area along the Pacifica State Beach and annually cleans to a level of "no visual impact." Trash picked up is quantified and identified for dominant types and possible sources. Photo documentation is used to show before and after conditions. The City of Pacifica's shoreline hot spot is located in TMA 5A.

Actions planned for future cleanup of this area between July 2014 and July 2022 include clean up of up to 4 times a month. The City will also continue to work with the Pacifica Beach Coalition in various annual beach clean ups.

3.2.10 Summary of Trash Control Measures

Trash Management Area 1

- Full-Trash Capture Devices
- Street Sweeping
- On-land Trash Cleanups

Trash Management Area 2

- Street Sweeping
- On-land Trash Cleanups

Trash Management Area 3
- Full-Trash Capture Devices
- Street Sweeping

Trash Management Area 4
- Street Sweeping
- On-land Trash Cleanups

Trash Management Area 5
- On-land Trash Cleanups
- Street Sweeping

Trash Management Area 6
- Improved Trash Bins/Container Management
- Street Sweeping

Trash Management Area 7
- Improved Trash Bins/Container Management
- Street Sweeping

The City of Pacifica is confident that the control measures selected will achieve the "full" trash reduction level in each of the management area.

3.3 Control Measure Implementation Schedule

Control Measures initiated prior to and continued after the MRP effective date are Street Sweeping, Storm Drain Inlet Maintenance and Storm Pump Station Maintenance.

The City of Pacifica has implemented several Control Measures to date via the short-term trash reduction plan and is detailed in Section 1.2.3.

Actions planned for future implementation between July 2014 and July 2022 are Installation of additional Trash Capture Devices, increased Street Sweeping, On-land Trash Cleanups and Improved Trash Bins/Container Management.

Table 7. City of Pacifica trash control measure implementation schedule.

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
TMA #1 Food Retail														
Full Trash Capture Devices					X	X	X	X	X	X	X	X	X	X
Street Sweeping	X									X	X	X	X	X
On-land Cleanups													X	X
TMA #2 Schools														
Street Sweeping										X	X	X	X	X
On-land Cleanups													X	X
TMA #3 Retail Commercial														
Full Trash Capture Devices					X	X	X	X	X	X	X	X	X	X
Street Sweeping	X									X	X	X	X	X
TMA #4 Parks/Play Fields														
Street Sweeping													X	X
On-land Cleanups													X	X
TMA #5 Beaches														
On-land Cleanups									X	X	X	X	X	X
Street Sweeping										X	X	X	X	X
TMA #6 Churches and Community Organizations														
Improved Trash Bins/Container Management							X	X	X	X	X	X	X	X
Street Sweeping										X	X	X	X	X
TMA #7 Rest of City														
Improved Trash Bins/Container Management							X	X	X	X	X	X	X	X

Trash Management Area and Control Measures	Pre-MRP	Short-Term					Long-Term							
		FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014[a]	FY 2014-2015	FY 2015-2016	FY 2016-2017[b]	FY 2017-2018	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022[c]
Street Sweeping										X	X	X	X	X
Jurisdiction-wide Control Measures														
Single Use Carryout Bag Policy						X	X	X	X	X	X	X	X	X
Polystyrene Foam Food Service Ware Policies			X	X	X	X	X	X	X	X	X	X	X	X
Public Information and Outreach Programs	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Creek and Shoreline Hot Spot Cleanups														
On-land Cleanups		X	X	X	X	X	X	X	X	X	X	X	X	X

[a] July 1, 2014 - 40% trash reduction target
[b] July 1, 2017 - 70% trash reduction target
[c] July 1, 2022 - 100% trash reduction target

4.0 PROGRESS ASSESSMENT STRATEGY

Provision C.10.a.ii of the MRP requires Permittees to develop and implement a trash load reduction tracking method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction targets. Early into the MRP, Permittees decided to work collaboratively to develop a trash load reduction tracking method through the Bay Area Stormwater Management Agencies Association (BASMAA). Permittees, Water Board staff and other stakeholders assisted in developing Version 1.0 of the tracking method. On behalf of all MRP Permittees, the Bay Area Stormwater Management Agencies Association (BASMAA) submitted Version 1.0 to the Water Board on February 1, 2012.

The Trash Assessment Strategy (Strategy) described in this section is intended to serve as Version 2.0 of the trash tracking method and replace version 1.0 previously submitted to the Water Board. The Strategy is specific to Permittees participating in the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), including the City of Pacifica. The City intends to implement the Strategy in phases and at multiple geographical scales (i.e., jurisdiction-wide and trash management area) in collaboration with SMCWPPP. Pilot implementation is scheduled for the near-term and as assessment methods are tested and refined, the Strategy will be adapted into a longer-term approach. The Strategy selected by the City is described in the following sections.

4.1 SMCWPPP Pilot Assessment Strategy

The following SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP Pilot Strategy) was developed by SMCWPPP on behalf of the City and other San Mateo County Permittees. The SMCWPPP Pilot Strategy will be implemented at a pilot scale on a countywide basis and includes measurements and observations in the City of Pacifica.

4.1.1 Management Questions

The SMCWPPP Pilot Strategy is intended to answer the following core management questions over time as trash control measures outlined in section 3.0 are implemented and refined:

- Are the MS4 trash load reduction targets being achieved?
- Have trash problems in receiving waters been resolved?
- If trash problems in receiving waters exist, what are the important sources and transport pathways?

The SMCWPPP Pilot Strategy, including indicators and methods, is summarized in this section and fully described in the SMCWPPP Pilot Trash Assessment Strategy, a compendium document submitted to the Water Board on February 1, 2014 on behalf of all SMCWPPP Permittees (SMCWPPP 2014).

4.1.2 Indicators of Progress and Success

The management questions listed in the previous section will be addressed by tracking information and collecting data needed to report on a set of key environmental indicators. Environmental indicators are simple measures that communicate what is happening in the environment. Since trash in the environment is very complex, indicators provide a more practical

and economical way to track the state of the environment than if we attempted to record every possible variable.

With regard to municipal stormwater trash management, indicators are intended to detect progress towards trash load reduction targets and solving trash problems. Ideally, indicators should be robust and able to detect progress that is attributable to multiple types of trash control measure implementation scenarios. Assessment results should also provide Permittees with an adequate level of confidence that trash load reductions from MS4s have occurred, while also assessing whether trash problems in receiving waters have been resolved. Indicators must also be cost effective, relatively easy to generate, and understandable to stakeholders.

Primary and secondary indicators that SMCWPPP Permittees will use to answer core management questions include:

Primary Indicators:

1-A Reduction in the level of trash present on-land and available to MS4s
1-B Effective full capture device operation and maintenance

Secondary Indicators:

2-A Successful levels of trash control measures implementation
2-B Reductions in the amount of trash in receiving waters

In selecting the indicators above, the City of Pacifica in collaboration with SMCWPPP and other SMCWPPP Permittees recognize that no one environmental indicator will provide the information necessary to effectively determine progress made in reducing trash discharged from MS4s and improvements in the level of trash in receiving waters. Multiple indicators were therefore selected.

The ultimate goal of municipal stormwater trash reduction strategies is to reduce the impacts of trash associated with MS4s on receiving waters. Indicators selected to assess progress towards this goal should ideally measure outcomes (e.g., reductions in trash discharged). The primary indicators selected by SMCWPPP are outcome-based and include those that are directly related to MS4 discharges. Secondary indicators are outcome or output-based and are intended to provide additional perspective on and evidence of, successful trash control measure implementation and improvements in receiving water condition with regard to trash.

As described in Section 2.2, trash is transported to receiving waters from pathways other than MS4s, which may confound our ability to observe MS4-associated reductions in creeks and shorelines. Due to this challenge of linking MS4 control measure implementation to receiving water conditions, the receiving water based indicator is currently considered a secondary indicator. Evaluations of data on the amount of trash in receiving waters that are conducted over time through the Pilot Assessment Strategy will assist the City in further determinations of the important sources and pathways causing problems in local creeks, rivers and shorelines.

4.1.3 Pilot Assessment Methods

This section briefly summarizes the preliminary assessment methods that the City of Pacifica will implement through the SMCWPPP Pilot Strategy to generate indicator information described in the previous section. Additional information on each method can be found in the SMCWPPP

Pilot Trash Assessment Strategy submitted to the Water Board by SMCWPPP on behalf of the City.

1-A. On-land Visual Assessments

As part of the Trash Generation Map assessment and refinement process (see Section 2.3.1), a draft on-land visual assessment method was developed to assist Permittees in confirming and refining trash generating area designations (i.e., very high, high, moderate and low trash generating categories). The draft on-land visual assessment method is intended to be a cost-effective tool and provide Permittees with a viable alternative to quantifying the level of trash discharged from MS4s. As part of BASMAA's *Tracking California's Trash* grant received from the State Water Resources Control Board (see Section 4.2), quantitative relationships between trash loading from MS4s and on-land visual assessment condition categories will be established. Condition categories defined in the draft on-land assessment protocol are listed in Table 8

Table 8. Trash condition categories used in the draft on-land visual assessment protocol.

Trash Condition Category	Summary Definition
A (Low)	Effectively no trash is observed in the assessment area.
B (Moderate)	Predominantly free of trash except for a few pieces that are easily observed.
C (High)	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets.
D (Very High)	Trash is continuously seen throughout the assessment area, with large piles and a strong impression of lack of concern for litter in the area.

On-land visual assessments will be conducted in trash management areas within the City of Pacifica as part of the SMCWPPP Pilot Trash Assessment Strategy. On-land assessments are intended to establish initial conditions and detect improvements in the level of trash available to MS4s over time. More specifically, on-land visual assessment methods will be conducted in areas not treated by trash full capture devices in an attempt to evaluate reductions associated with other types of control measures. Assessment methods for areas treated by full capture devices are described in this next section.

Given that the on-land assessment method and associated protocol have not been fully tested and refined, initial assessments will occur at a pilot scale in the City and in parallel to the *Tracking California's Trash* project. The frequency of assessments and number of sites where assessments will occur during the pilot stage are more fully described in the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014).

1-B. Full Capture Operation and Maintenance Verification

Consistent with the MRP, adequate inspection and maintenance of trash full capture devices is required to maintain full capture designation by the Water Board. The City of Pacifica is currently developing an operation and maintenance verification program (Trash O&M Verification Program), via SMCWPPP, to ensure that devices are inspected and maintained at a level that maintains this designation.

The SMCWPPP Trash O&M Verification Program will be modeled on the current O&M verification program for stormwater treatment controls implemented consistent with the Permit new and redevelopment requirements. Additional details regarding the Trash O&M Verification Program can be found in the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014).

2-A. Control Measure Effectiveness Evaluations

In addition to on-land trash assessments and full capture operation and maintenance verification, the City will also conduct assessments of trash control measures implemented within their jurisdictional area. Assessment methods will be selected based on trash sources and the type of control measure being implemented. Control measure effectiveness evaluations are more fully described in the SMCWPPP Pilot Trash Assessment Strategy. The following are example assessment methods that may be used to demonstrate successful control measure implementation and progress towards trash reduction targets:

- Product-related Ordinances – Annually tracking and reporting the % of businesses in compliance with the ordinance and the percentage requiring a response.
- Street Sweeping – Reporting the frequency of sweeping and ability to sweep to the curb in specific areas where enhanced sweeping is implemented; and/or documenting the level of trash on streets directly after street sweeping during wet and dry weather seasons.
- Public/Private Trash Container Management – Reporting the magnitude and extent of enhanced actions; and/or visually assessing and documenting conditions around public trash containers before and after implementing enhanced control measures.
- Targeted Outreach and Enforcement – Reporting the magnitude and extent of enhanced actions; tracking and reporting the % increase in enforcement actions; and/or visually assessing and documenting the conditions in targeted areas before and after implementing control measures.
- Public Outreach Campaigns – Reporting the magnitude and extent of enhanced actions, and/or conducting pre and post campaign surveys.
- On-land Cleanups and Enforcement – Reporting the magnitude and extent of enhanced actions; visually assessing and documenting the conditions in targeted areas before and after control measure implementation; and/or tracking the volumes of trash removed.
- Illegal Dumping Prevention – Reporting the magnitude and extent of enhanced actions; and/or tracking and reporting improvements in the number of incidents.

- Business Improvement Districts – Reporting the magnitude and extent of enhanced actions; and/or visually assessing and documenting the conditions in BID areas before and after implementing control measures.
- Prevention of Uncovered Loads - Reporting the magnitude and extent of enhanced actions; tracking and reporting the decreases in the number of incidents; and/or visually assessing and documenting the conditions in targeted areas before and after implementing control measures.
- Partial Capture Devices – Reporting the magnitude and extent of enhanced actions; and/or visually assessing and the amount of trash in storm drains or downstream of partial capture devices.

2-C. Receiving Water Condition Assessments

The ultimate goal of stormwater trash management in the Bay Area is to significantly reduce the amount of trash found in receiving waters. In the last decade, San Mateo County Permittees and volunteers have collected data on the amounts of trash removed during cleanup events. More recently, Permittees have conducted trash assessments in creek and shoreline hotspots using standardized assessment methods. In an effort to answer the core management question *Have trash problems in receiving waters been resolved?,* the City of Pacifica plans to continue conducting receiving water condition assessments at trash hot spots a minimum of one time per year. Assessment will be conducted consistent with Permit hot spot cleanup and assessment requirements. Additional information on receiving water assessment methods can be found in the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014).

4.2 BASMAA "Tracking California's Trash" Project

The SMCWPPP Pilot Assessment Strategy described in the previous section recognizes that outcome-based trash assessment methods needed to assess progress toward trash reduction targets are not well established by the scientific community. In an effort to address these information gaps associated with trash assessment methods, the Bay Area Stormwater Management Agencies Association (BASMAA), in collaboration with SMCWPPP, the 5 Gyres Institute, San Francisco Estuary Partnership, the City of Los Angeles, and other stormwater programs in the Bay Area, developed the *Tracking California's Trash* Project. The Project is funded through a Proposition 84 grant awarded to BASMAA by the State Water Resources Control Board (SWRCB) who recognized the need for standardized trash assessment methods that are robust and cost-effective.

The Project is intended to assist BASMAA member agencies in testing trash assessment and monitoring methods needed to evaluate trash levels in receiving waters, establish control measures that have an equivalent performance to trash full capture devices, and assess progress in trash reduction over time. The following sections provide brief descriptions of tasks that BASMAA will conduct via the three-year Project. Full descriptions of project scopes, deliverables, and outcomes will be developed as part of the task-specific Sampling and Analysis Plans required by the SWRCB during the beginning of the Project. The Project is currently underway and will continue through 2016.

4.2.1 Testing of Trash Monitoring Methods

BASMAA and the 5 Gyres Institute will evaluate the following two types of assessment methods as part of the Project:

- **Trash Flux Monitoring** – Trash flux monitoring is intended quantify the amount of trash flowing in receiving waters under varying hydrological conditions. Flux monitoring will be tested in up to four receiving water bodies in San Francisco Bay and/or the Los Angeles areas. Methods selected for evaluation and monitoring will be based on a literature review conducted during this task and through input from technical advisors and stakeholders. Monitoring is scheduled to begin in 2014 and will be completed in 2016.

- **On-land Visual Assessments** – As part of the Project, BASMAA will also conduct an evaluation of on-land visual assessment methods that are included in the SMCWPPP Pilot Assessment Strategy. The methods are designed to determine the level of trash on streets and public right-of-ways that may be transported to receiving waters via MS4s. BASMAA plans to conduct field work associated with the evaluation of on-land visual assessment at a number of sites throughout the region. To the extent practical, sites where the on-land methods evaluations take place will be coordinated with trash flux monitoring in receiving waters. On-land assessments will occur in areas that drain to trash full capture devices, and all sites will be assessed during wet and dry weather seasons in order to evaluate on-land methods during varying hydrologic conditions. Monitoring is scheduled to begin in 2014 and will be completed in 2016.

4.2.2 Full Capture Equivalent Studies

Through the implementation of BASMAA's *Tracking California's Trash* grant-funded project, a small set of "Full Capture Equivalent" projects will also be conducted in an attempt to demonstrate that specific combinations of control measures will reduce trash to a level equivalent to full capture devices. Initial BMP combinations include high-frequency street sweeping, and enhanced street sweeping with auto-retractable curb inlet screens. Other combinations will also be considered. Studies are scheduled to begin in 2014 and will be completed in 2016.

4.3 Long-Term Assessment Strategy

The City of Pacifica is committed to implementing standardized assessment methods post-2016 based on the lessons learned from pilot assessments and studies that will occur between 2014 and 2016. Assessment activities described in the previous sections will evaluate the utility of different assessment methods to demonstrate progress towards trash reduction targets and provide recommended approaches for long-term implementation. Lessons learned will be submitted to the Water Board with the FY 2015-2016 Annual Report and a revised Strategy will be developed and submitted, if necessary. The revised Strategy will include agreed upon assessment methods that will be used to demonstrate progress during the remaining term of trash reduction requirements. Reporting using the new/revised methods will begin with the FY 2016-17 Annual Report.

4.4 Implementation Schedule

The implementation schedule for the SMCWPPP Pilot Implementation Strategy, BASMAA's Tracking California's Trash project, and the Long-Term Assessment Strategy are included in Table 9. Load reduction reporting milestones are also denoted in the table. The schedule is consistent with the need for near-term pilot assessment results to demonstrate progress toward short-term targets, while acknowledging the need for testing and evaluation of assessment methods and protocols prior to long-term implementation. For more detailed information on implementation timelines, refer to the SMCWPPP Pilot Trash Assessment Strategy (SMCWPPP 2014) and monitoring plans developed as part of BASMAA's Tracking California's Trash project.

Table 9. City of Pacifica trash progress assessment implementation schedule.

Trash Assessment Programs and Methods	Fiscal Year									
	Prior to FY 2013-14	2013-14[a]	2014-15	2015-16	2016-17[b]	2017-18	2018-19	2019-20	2020-21	2021-22[c]
Pilot Trash Assessment Strategy (SMCWPPP)										
On-land Visual Assessments										
Initial (Baseline) Assessments	X									
Pilot Progress Assessments		X	X	X	X					
Full Capture Operation and Maintenance Verification			X	X	X					
Control Measure Effectiveness Evaluations	X	X	X	X	X					
Receiving Water Condition Assessments	X	X	X	X	X					
Tracking California's Trash Project (BASMAA)										
Testing of Trash Monitoring Methods										
Trash Flux Monitoring Protocol Testing			X	X	X					
On-land Visual Assessment Evaluations			X	X	X					
Full Capture Equivalent Studies			X	X	X					
Long-Term Trash Assessment Strategy (SMCWPPP)						X	X	X	X	X

[a]July 1, 2014 - 40% trash reduction target
[b]July 1, 2017 - 70% trash reduction target
[c]July 1, 2022 - 100% trash reduction target

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6.0 APPENDICES

APPENDIX A. STAFF REPORT TO CITY COUNCIL ADOPTING LONG-TERM PLAN

CITY OF PACIFICA
COUNCIL AGENDA SUMMARY REPORT

1/27/2014

SUBJECT:

Long-Term Trash Load Reduction Plan and Assessment Strategy

ORIGINATED BY:

Public Works

STAFF CONTACT:

Raymund Donguines - (650) 738-3768
donguinesr@ci.pacifica.ca.us

BACKGROUND/DISCUSSION:

In October 2009, the San Francisco Bay Regional Water Quality Control Board (Water Board) issued a new regional National Pollutant Discharge Elimination System (NPDES) storm water permit to the City of Pacifica (the City) and 76 other Bay Area entities for discharge of municipal storm water to local creeks and San Francisco Bay. The Municipal Regional Permit (MRP) specifies programs and measures to be conducted by local agencies to minimize storm water pollution through the year 2014. One of the areas of focus in the MRP is control of trash in local waterways. The MRP requires each Permittee to reduce trash loading to its storm drain system by 40 percent by 2014, 70 percent by 2017, and to no adverse impact by 2022. Each Permittee was required to submit a Short-Term Trash Load Reduction Plan by February 1, 2012 in order to document how the 2014 trash reduction goal would be met. Additionally, a Long-Term Trash Load Reduction Plan, documenting how the City intends to meet the 2017 and 2022 trash reduction goals must be submitted to the Water Board by February 1, 2014.

To comply with the trash load reduction requirements, Permittees are required to determine how much trash is conveyed through the storm drain system to creeks and waterways; implement actions to reduce that trash; and document trash reductions achieved. This is challenging, because trash can be wind-blown or dumped directly into creeks in addition to traveling through the storm drain system.

Baseline trash levels were determined through a regional effort coordinated by the Bay Area Stormwater Management Agencies Association (BASMAA). The Long-Term Trash Reduction Plan framework was developed regionally by Permittees, the San Mateo Countywide Stormwater Pollution Prevention Program (SMCWPPP), and other Bay Area-wide stormwater program staff, in collaboration with Water Board staff. Pacifica's Long-Term Trash Management Plan contains the following elements:

- Identification of 6 Trash Management Areas based on in-field litter assessments
- Identification of appropriate trash control measures for each Trash Management Area
- Implementation plan for new trash control measures in targeted areas

- Assessment of trash control measures
- Ongoing adaptive management of trash control measures

The first step in the Long-Term Trash Load Reduction Plan framework requires Permittees to identify very high, high, moderate, and low trash-generating areas within their jurisdictions. Trash generation rates, developed through the BASMAA regional study, were used as a starting point; then Permittees used local knowledge and field and/or desktop assessments to confirm and refine the level of trash generation for specific areas. For the City, 6 Trash Management Areas were identified as both high and moderate trash-generation areas. The resulting maps are included in the attached Long-Term Trash Load Reduction Plan. Water Board staff and regional stormwater managers have agreed that trash reduction efforts should be targeted at areas with high and moderate levels of trash generation.

Trash control measures implemented to date include the following highlights:

- Street Sweeping: High-priority areas are swept once per week and other areas twice a month. Any potential future changes to the street sweeping program will be coordinated to ensure continued compliance with the trash management requirements of the stormwater permit.
- Full Trash Capture: The City installed 64 Full Trash Capture devices throughout the City. The units were funded by a San Francisco Estuary Project (SFEP) grant.
- Single-Use Plastic Bag Ordinance: The City banned single-use plastic bags at retail stores in 2013.
- Polystyrene Ordinance: The City's ordinance prohibiting use Polystyrene in food service establishments went into effect in 2010.
- Public Outreach and Education: The City continuous to participate in regional outreach campaigns related to litter.

The Long-Term Trash Load Reduction Plan proposes continuing the City's trash management programs. In addition, the following additional actions are proposed as part of the Long-Term Trash Load Reduction Plan. Any actions that are recommended for implementation and that have budget implications will be brought back to the Council for approval:

- Considerations to install trash capture devices to cover the entire food retail and commercial retail trash management areas.
- Consideration of expanding the City's Street Sweeping program: High-priority areas are swept twice per week.
- Additional school outreach and a new school inspection program related to litter.
- Consideration of expanding the City and Volunteer led On-Land Clean Up (litter removal) program.

City staff will work closely with SMCWPPP co-permittees and Water Board staff to develop a tracking method to account for trash load reductions and track progress toward trash load reduction targets. A regional pilot strategy will be used to test the effectiveness of proposed trash assessment and monitoring methods.

The Long-Term Trash Load Reduction Plan must be submitted to the Water Board on February 1, 2014 as part of the requirements of the stormwater discharge permit. Implementation of the plan is intended to meet the requirements for trash load reduction of 70% by 2017 and no adverse impact by 2022.

FISCAL IMPACT:

The Long-Term Trash Load Reduction Plan states that the Council maintains discretion over the level of expenditures for trash control measures and service level implementation in accordance with the City's annual budget process and the Municipal Code. Inclusion of a proposed action in the Long-Term Trash Load Reduction Plan does not obligate the City to implement it. Changes to the plan will be submitted to the Water Board annually as part of the Stormwater Permit annual reporting process.

The costs related to implementation of this plan will be developed following additional analysis, with separate approvals by the Council, as required. It is anticipated that some of the proposed actions can be accommodated within existing budgets. The full trash capture feasibility study, if needed, will require additional funding as will additional trash assessment efforts. The primary source of any additional funding that may be needed will be the NPDES Fund. Should full trash capture capital projects be needed to comply with trash management requirements, staff will pursue grant funding as was done for the existing trash capture devices.

COUNCIL ACTION REQUESTED:

Staff recommends that Council approve the attached Draft Long-Term Trash Load Reduction Plan and Assessment Strategy (Attachment 1) required by the City's stormwater discharge permit. The Draft Long-Term Trash Load Reduction Plan and Assessment Strategy will be finalized and submitted to the Regional Water Quality Control Board by February 1, 2014.

ATTACHMENT LIST:

Draft Long-Term Trash Load Reduction Plan and Assessment Strategy (PDF)